AUDIT

PROFESSIONAL TIRE MANAGEMENT SYSTEM

TIRE SURVEY TOOLS
USER'S MANUAL

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INTRODUCTION TO THE AUDIT PROFESSIONAL TIRE MANAGEMENT SYSTEM

1.1 **AUDIT** Professional Tire Management System Overview

The **AUDIT** Professional Tire Management System is a powerful, comprehensive, Windows-based software program combined with high tech electronic tire inspection tools, specifically designed for fleets and suppliers, to reduce operating costs by establishing and maintaining a professional tire management database of vehicles and associated tires.

The **AUDIT** System provides the means to survey the database tires to establish and record their current physical condition and to measure and record tread wear, using a DATA **AUDIT** hand held tool and a TREAD **AUDIT** electronic tread depth gauge. It also provides the means to check and record initial tire pressure and to implement any necessary inflation or deflation of the tire using an AIR **AUDIT** auto-inflate tool, remotely controlled by the hand held DATA **AUDIT** Tool. **AUDIT** also provides for the entering of tire pressure measurements made without the use of the AIR **AUDIT** Tool into the database.

In order to conduct a tire survey, the vehicle data is downloaded from the computer into the hand held DATA **AUDIT** Tool. After completion of the tire survey, the modified survey data is uploaded to the computer for review and appropriate action.

This User's Manual contains descriptions of the **AUDIT** Tire Survey Tools and accessories that enable downloading of vehicle data into the DATA **AUDIT** Tool, conducting of a tire survey, and the subsequent uploading of the audit survey data back into the computer. It also contains details of typical DATA **AUDIT** Tool screen displays that prompt and guide the user through the sequence of operations. A separate **AUDIT** Implementation Guide and Fleet Set-up Guide describing the **AUDIT** Professional Tire Management software program and its installation and use is available.

1.2 **AUDIT** Tire Survey Tools and Accessories Checklist.

ITEM	QTY	DESCRIPTION
1	1	DATA **AUDIT** Tool (including an installed DATA **AUDIT** Battery Pack)
2	1	TREAD**AUDIT** Tool
3	1	AIR **AUDIT** Tool
4	1	**AUDIT** BATTERY CHARGER/DOCKING Tool
5	2	DATA **AUDIT** Battery Pack (One already installed in the DATA **AUDIT** Tool)
6	2	AIR **AUDIT** Battery Pack
7	1	AC Power Cord Assembly
8	1	RS232 Interface Cable Assembly
9	1	**AUDIT** Air Hose
10	1	AIR **AUDIT** Input Hose
11	1	AIR **AUDIT** Output Quick-Connect Air Chuck

UNPACKING AND INSPECTION OF AUDIT TOOLS

2.1 Unpacking

Carefully unpack the AUDIT Tools and accessories to determine that all the items listed in the check off list in Section 1 are present.

2.2 Inspection

2.2.1 Carefully inspect all items to ensure that there is no obvious damage to any of the items received. Record and report any damage observed to International Marketing, Inc. via fax to 717-264-5483.

2.2.2 Check that the Battery Pack installed in the DATA **AUDIT** Tool is firmly seated. Press the ON/OFF button, hold it down until a screen display is seen.

2.2.3 Press the ENTER button and then the ON/OFF button to turn the DATA **AUDIT** Tool OFF. The screen display should extinguish.

2.2.4 Ensure that the DATA **AUDIT** Tool remains OFF when not in use, and has a battery pack installed, to ensure unnecessary drain on the internal back-up battery or the DATA **AUDIT** Battery Pack.

2.2.5 Install an AIR **AUDIT** Battery Pack into the AIR **AUDIT** Tool and press the Red ON/OFF button; the button should stay depressed and become back lit.

2.2.6 Press the ON/OFF button again. The back lighting should extinguish.

2.2.7 Ensure that the AIR **AUDIT** Tool remains OFF to ensure unnecessary drain on the AIR **AUDIT** Battery Pack.

2.3 Re-packing

2.3.1 Retain the packing boxes and packing materials in which the **AUDIT** equipment items were received.

2.3.2 If there is a need to return any items, return them in the boxes and packed in the packing materials in the manner in which they were received. All returns should be directed to:

Advanced Concepts Manufacturing, Inc.
325 Paul Avenue
St. Louis, MO 63135
Phone: 314-524-9870

AUDIT SYSTEM TOOLS AND ACCESSORIES

3.1 DATA **AUDIT** Tool

The DATA **AUDIT** Tool is a user friendly hand held unit designed to integrate with the AUDIT Professional Tire Management System software program, and with the other **AUDIT** System Tools and accessories, to provide the means to conduct a tire survey and audit on any selected set of up to 50 vehicles with up to 20 wheel positions each from the Tire Management software **AUDIT** database.

The DATA **AUDIT** Tool interfaces with the computer, in which the **AUDIT** database is installed, for downloading of vehicle data and uploading of **AUDIT** data. This is achieved by installing the DATA **AUDIT** Tool into the docking channel of the **AUDIT** Battery Charger/Docking Tool. This enables the DATA **AUDIT** Tool to interface with the computer via a serial port.

The DATA **AUDIT** Tool also interfaces with the TREAD **AUDIT** Tool, via a multi-wire cable connection, to measure tire tread depths.

The DATA **AUDIT** Tool also interfaces with the AIR **AUDIT** Tool, via a radio link, to make tire air pressure (psi) measurements and to perform tire inflation or deflation operations.

The DATA **AUDIT** Tool is powered by a DATA **AUDIT** Battery Pack, and has an ON/OFF button, which enables the DATA **AUDIT** Tool to be switched OFF, when not in use, to conserve DATA **AUDIT** Battery Pack power.

Operation of the DATA **AUDIT** Tool is controlled by means of a minimal number of keypad buttons, ergonomically sized, shaped and positioned for logical and easy operation. These buttons are conveniently situated on the front of the handle portion of the DATA **AUDIT** Tool.

Operational prompts, selections and directives, which guide the operator through a tire data audit, are presented on a series of progressive screens on a square liquid crystal graphic display located in the upper portion of the DATA **AUDIT** Tool. This display has contrast adjustment via + and – contrast buttons located at the top left of DATA **AUDIT** Tool for optimizing legibility of the display.

The downloaded vehicle data includes the vehicle identification numbers (Ids) which, with corresponding tire location diagrams, are displayed on the graphic screen. During the tire data audit each tire position to be audited is indicated, in turn, by a blinking ON and OFF of the wheel position graphic on the vehicle layout. As an audit on a tire is completed the next tire to be audited is indicated by the blinking of its wheel position on the graphic vehicle layout. Spare tires are also represented graphically. When the last vehicle wheel position tire has been audited, the spare tire graphics will blink ON and OFF in turn, as they are audited. Tires can be re-inspected, skipped or the inspection sequence changed by scrolling via the arrow keys.

3.2 TREAD **AUDIT** Tool

The TREAD **AUDIT** Tool is a hand held assembly with a sliding probe which is designed for insertion into tire tread grooves for the purpose of determining the tread depth at the point of measurement.

The **AUDIT** System is programmed for the user to take four tread depth measurements, each at a different point on the tire, for each tire.

To obtain a zero reference for tread depth measurements, the TREAD **AUDIT** Tool is placed on a flat surface to depress the probe so that it completely enters the body of the TREAD **AUDIT** Tool. At that point, the RECORD button on one side of the TREAD **AUDIT** assembly or the ENTER key on the DATA AUDIT is pressed to record the zero reference in the hand held DATA **AUDIT** Tool.

The interface between the DATA **AUDIT** Tool and the TREAD **AUDIT** Tool is via a multi-wire cable attached to the TREAD **AUDIT** Tool. A multi-pin connector on the end of this cable plugs into a matching multi-pin connector mounted on the top end of the DATA **AUDIT** Tool.

The DATA **AUDIT** Tool provides power to the TREAD **AUDIT** Tool via the multi-wire cable connection, and signals conveying the tread depth measurements are passed from the TREAD **AUDIT** Tool to the DATA **AUDIT** Tool via the multi-wire cable connection.

3.3 AIR **AUDIT** Tool

The AIR **AUDIT** Tool is a stand alone assembly which contains a pneumatic valve assembly, and the means to connect a local compressed air supply hose to the INPUT (AIR IN) of the AIR **AUDIT** Tool, and to connect an air hose to the AIR **AUDIT** Tool OUTPUT (AIR OUT) for connection to a tire being audited.

The AIR **AUDIT** Tool also contains circuitry that provides for radio reception of command signals from the hand held DATA **AUDIT** Tool, to operate the pneumatic valves, and for radio transmission of operational confirmation and measurement signals to the DATA **AUDIT** Tool.

The AIR **AUDIT** Tool responds to the commands from the DATA **AUDIT** Tool to record initial tire inflation pressure of a tire being audited. It also responds to commands to inflate or deflate the tire to reach a recommended psi as directed from the DATA **AUDIT** Tool. This air pressure parameter originates at the AUDIT Database. The AIR AUDIT will also confirm final pressure readings.

The AIR **AUDIT** Tool is powered by an AIR **AUDIT** Tool Battery Pack, and has a backlit ON/OFF button, which enables the AIR **AUDIT** Tool to be switched OFF, when not in use, to conserve AIR **AUDIT** Battery Pack power. The radio signals between the DATA **AUDIT** and AIR **AUDIT** Tools contain a pre-set equipment identification code that is unique to the DATA **AUDIT** and AIR **AUDIT** Tool pair that are part of an **AUDIT** System. This ensures that in a multi **AUDIT** System environment only the DATA **AUDIT** and AIR **AUDIT** Tools that belong to the same **AUDIT** System will be able to communicate with each other. Interference between different **AUDIT** Systems is thereby prevented.

Note: The red "Reset" button on the DATA AUDIT can be used to temporarily disable the AIR AUDIT if needed.

3.4 **AUDIT** BATTERY CHARGER/DOCKING Tool

The **AUDIT** Battery Charger/Docking Tool is a flat-surface mounting assembly, which provides a dual function. It provides docking positions and circuitry for recharging two of each type of **AUDIT** Battery Packs simultaneously, and a docking channel and circuitry to provide a link for the DATA **AUDIT** Tool to interface with the computer in which the **AUDIT** database is installed.

The **AUDIT** Battery Charger/Docking Tool is designed to be powered from a standard 100-125 volt 60Hz outlet. The accessory AC Power Cord Assembly (Item 9) is provided for this purpose. A replaceable miniature 250 Volts 250 milliampere (mA) rated fuse is installed in the AC input line connector assembly.

3.4.1 **AUDIT** Battery Charger Section

The **AUDIT** Battery Charger Section provides docking positions and associated circuitry for recharging two DATA **AUDIT** Battery Packs and two AIR **AUDIT** Battery Packs, simultaneously.

Each battery pack docking position is shaped to receive the appropriate **AUDIT** Battery Pack in the correct orientation.

An installed battery pack that has less than full charge will cause an associated Light Emitting Diode (LED) to light. When the battery becomes fully charged the LED will extinguish. Each battery pack charging position has an associated LED.

3.4.2 DATA **AUDIT** Tool Docking Section

The **AUDIT** Tool Docking Station provides a docking channel that links the DATA **AUDIT** Tool to the computer in which the **AUDIT** database is installed. It connects to the DATA **AUDIT** Tool via an infrared link. It connects to the serial port of the computer via a cable (Item 8) provided with the **AUDIT** system.

3.5 **AUDIT** Battery Packs

The DATA **AUDIT** Battery Pack and the AIR **AUDIT** Battery Pack are each designed to fit into the housing of their respective **AUDIT** Tool.

3.6 AC Power Cord Assembly

The AC power cord assembly is 8 feet long. It has a standard North American 100-125 volt AC polarized 3-pin plug at one end and a miniature 3-socket connector at the other end. The connector is designed to be inserted into the housing of the fused mating connector on the **AUDIT** Battery Charger/Docking Tool, and it is shaped to provide a polarized connection. The cable assembly is rated at 125 volts, 10 Amps AC.

3.7 RS 232 Interface Cable Assembly

The RS 232 interface cable assembly is approximately 6 feet long. It has a standard 9-pin socket connector at each end. It is provided to interconnect the RS232 connector on the **AUDIT** Battery Charger/Docking Tool to an RS 232 connector on the **AUDIT** Database Computer.

3.8 **AUDIT** AIR HOSE

The air hose supplied is 10 feet long. It is provided for connection between the AIR **AUDIT** Tool AIR OUT port and the valve of the tire being audited, via an appropriate adapter (not supplied).

The air hose has a 3/8-inch inside diameter and is rated at 350 psi.

INSTALLING AND REMOVING AUDIT BATTERY PACKS

4.1 DATA **AUDIT** Tool Battery Pack

4.1.1 Installation

The DATA **AUDIT** Battery Pack is installed by insertion into the handle portion of the DATA **AUDIT** Tool. The DATA **AUDIT** Tool housing internal section complements the "D" cross-section shape of the battery pack, which should be orientated to fit into the housing and then firmly pushed into the housing as far as it will go. A "click" sound as the battery pack is fully inserted indicates that the battery pack has been "locked" into position by engagement of the spring locking tongue of the battery pack housing with the complementary indentation in the DATA **AUDIT** housing.

4.1.2 Removal

The battery pack should be gripped firmly, the locking tongue depressed, and the battery pack pulled straight out of the DATA **AUDIT** housing keeping it parallel with the sides of the DATA **AUDIT** housing.

4.2 AIR **AUDIT** Tool Battery Pack

4.2.1 Installation

The AIR **AUDIT** Battery Pack is installed into the top face of the AIR **AUDIT** Tool. The AIR **AUDIT** Battery Pack has a rectangular cross-section and the AIR **AUDIT** Tool has a complementary rectangular depression in its top face. Position the AIR **AUDIT** Tool so that this top face is uppermost. The AIR **AUDIT** Tool should then be held firmly in this position. The battery assembly should be positioned at an angle, aligned with the complementary shape of the depression in the AIR **AUDIT** housing. The short side of the battery assembly opposite to the end with the locking tongue should be inserted and pressed against the short side of the AIR **AUDIT** rectangular depression, which is opposite the locking end. The battery pack end in contact with the AIR **AUDIT** housing should then be held tightly against the housing as if this formed a hinge and the free end of the battery assembly should then be lowered into the AIR **AUDIT** housing until the upper face of the battery pack becomes flush with the AIR **AUDIT** housing face. A "click" at this point will indicate that the battery pack is "locked" into position.

4.2.2 Removal

Position the AIR **AUDIT** Tool so that its bottom face is uppermost. Hold it firmly in this position. Insert a finger into the depression between the two housings at the locking end of the battery pack. Curl this finger to get a grip under the battery pack housing locking tongue. Firmly pull backward and upward against the locking end of the battery pack to hinge it out of the AIR **AUDIT** Tool.

CONDUCTING AN AUDIT DATABASE DOWNLOAD INTO THE DATA AUDIT TOOL

Take the DATA **AUDIT** Tool to the **AUDIT** Battery Charger/Docking Tool and proceed as follows:

6.1 Setting Date and Time on the DATA **AUDIT** Tool screen.

6.1.1 Press the ON/OFF button on the DATA **AUDIT** Tool until the following Introductory screen display appears. Press the + and - buttons to adjust the screen contrast to provide the best viewing contrast with the prevailing lighting conditions.

Introductory Screen

```
IMI/BUDINI
DATA AUDIT
INSPECTION
TOOL

Copyright 1998 ACM
Version 0.2

Press ENTER
to Continue
```

6.1.2 Press the ENTER button. The below-left Date and Time Screen will appear.

Date and Time Screen

```
Are the date and time
Correct ?

      July 14, 1998

      10:45 P.M.
        -> Yes    No


Select option, then
press ENTER
```

Correct the Date and Time Screen

```
Use arrow keys to
enter date and time

      July 14, 1998

      10:45 P.M.

        (Month)

      Press ENTER
      to accept date
```

6.1.3 If the Date and Time are correct Press ENTER. The following Zero Tread Depth Probe Screen will appear. Continue to Step 6.2.

6.1.4 If the Date and/or Time are incorrect then proceed as follows:-

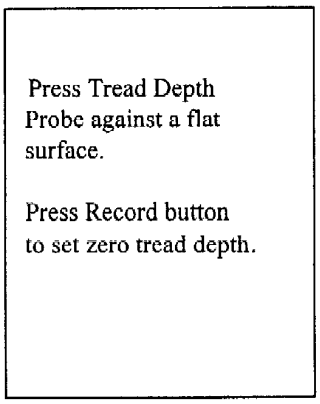
Select NO by pressing on the right-pointing arrow button and then pressing ENTER. The above-right Correct the Date and Time Screen will appear.

Follow the screen prompts and use the right-pointing arrow button to correct the date and/or time as necessary.

Press ENTER when date and/or time have been corrected.

The following Zero Tread Depth Probe Screen will appear.

Zero Tread Depth Probe Screen



6.2 Installing the DATA **AUDIT** Tool into the docking channel of the **AUDIT** Battery Charger/Docking Tool.

NOTE: Before installing the DATA **AUDIT** Tool into the **AUDIT** Battery Charger/Docking Tool, ensure that the **AUDIT** Battery Charger/Docking Tool is connected to a live standard 100-125 volt 60Hz outlet. Also ensure that the RS 232 cable is connected between the **AUDIT** Battery Charger/Docking Tool and the computer Com Port.

Also ensure that the required **AUDIT** database is in the computer and is ready to be downloaded into the DATA **AUDIT** Tool.

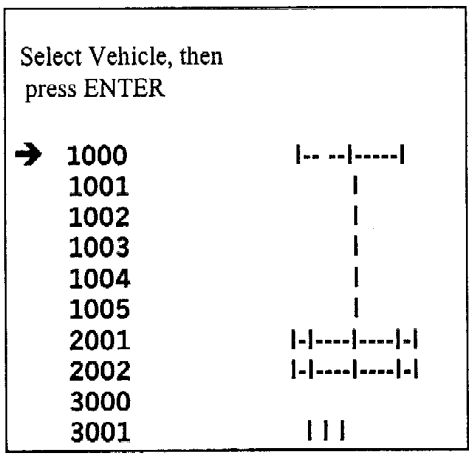
6.2.1 Place the DATA **AUDIT** Tool, with the screen side uppermost, into the docking channel in the **AUDIT** Battery Charger/Docking Tool.

6.3 Downloading the **AUDIT** Tire Database

6.3.1 Press ENTER. The following typical Vehicle Menu screen will appear if an **AUDIT** Tire Database is already loaded into the DATA **AUDIT** Tool.

However if there is no **AUDIT** Tire Database already loaded into the DATA **AUDIT** Tool, then this screen will appear but it will have no vehicle Ids and no vehicle and spare tire graphics.

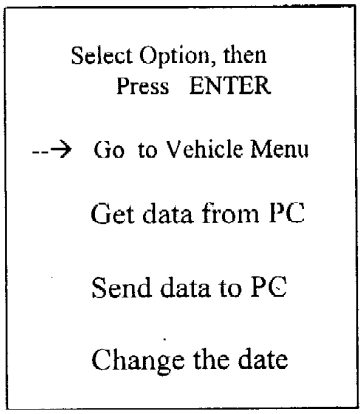
Vehicle Menu Screen (typical)



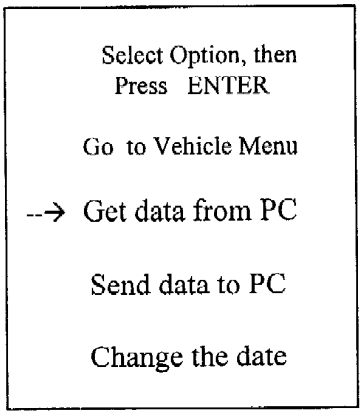
6.3.2 Press the MENU button on the DATA **AUDIT** Tool. The following Select Option screen, on the left, will appear.

Select "Get data from PC", using the down arrow button, as shown to the right. Press the ENTER button.

Select Option Screen



Select Option Screen with
"Get data from PC" selected



6.3.3 If the DATA **AUDIT** Tool contains AUDIT data that has not been uploaded to the computer, the Previous Measurement screen will appear as shown below right.

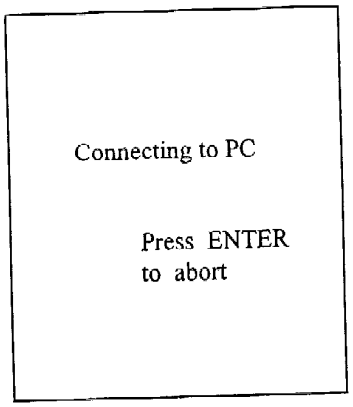
If you do not want to lose this data, select NO and press the ENTER button and you will be returned to the Menu screen. Refer to Section 9 for instructions on how to upload AUDIT data.

If you want to delete the previous data and continue with the download, select YES and press the ENTER button.

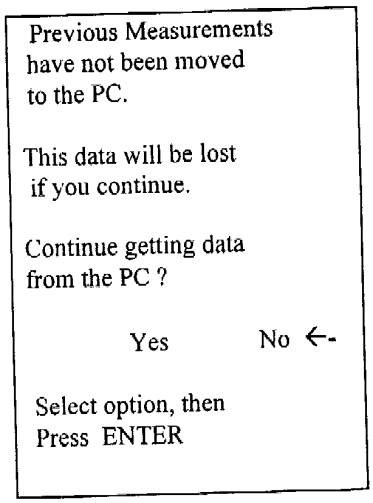
NOTE: If you select YES and press the ENTER button, previous data that was not uploaded will be lost and cannot be retrieved.

6.3.4 If you wish to proceed with the download, select Yes. The following Connecting to PC screen, on the left, will appear.

Connecting to PC Screen

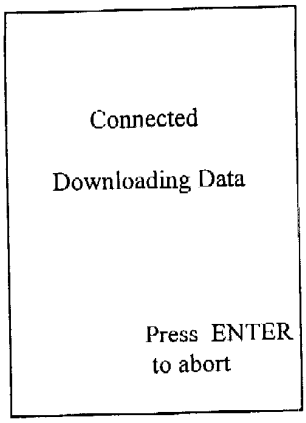


Previous Measurements Screen



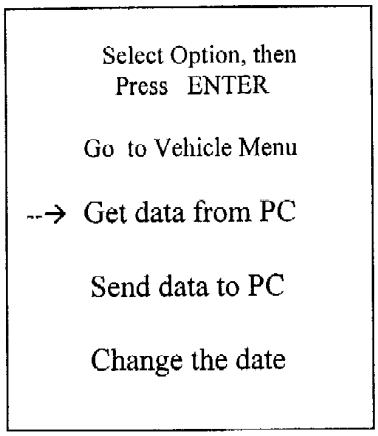
6.3.5 When the connection between the computer and the DATA **AUDIT** Tool is established the following Connected screen will appear.

Connected Screen



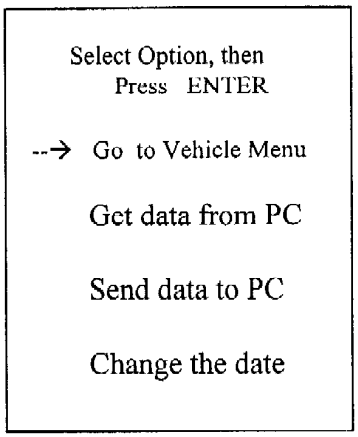
6.3.6 Upon completion of the download the Select Option Screen with "Get data from PC" selected will reappear, as follows.

Select Option Screen (with "Get data from PC" selected)



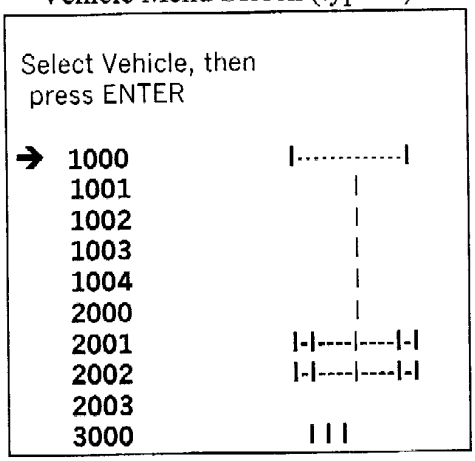
6.3.7 Move the arrow to select "Go to Vehicle Menu", as shown below.

Select Option Screen with "Go to Vehicle Menu" selected



6.3.8 Press ENTER. The Vehicle Menu screen will reappear but it will now have the vehicle ID list and vehicle and spare tire graphics of the newly downloaded vehicle data, as shown in the following typical Vehicle Menu screen

Vehicle Menu Screen (typical)



6.3.9 Remove the DATA **AUDIT** Tool from the docking channel and verify that the download is complete and correct, as follows.

6.4 Verifying the Download of the **AUDIT** Database into the DATA **AUDIT** Tool

6.4.1 Scan through the vehicle Ids to determine if all the required vehicles have been correctly downloaded into the DATA **AUDIT** Tool.

Do not make any database changes while making this check.

6.4.2 If it is determined that the download was successful, press the ON/OFF button to switch OFF the DATA **AUDIT** Tool.

6.4.3 Refer to Sections 7.0 and 8.0 to prepare for and to conduct an audit on the downloaded **AUDIT** Tire Database

SETTING UP THE AUDIT SYSTEM TOOLS TO PERFORM A TIRE AUDIT

7.1 Connecting the TREAD **AUDIT** Tool to the DATA **AUDIT** Tool

Connect the TREAD **AUDIT** Tool cable connector to the DATA **AUDIT** Tool mating connector, ensuring that the red dot on the TREAD **AUDIT** Tool connector is in line with the red dot on the DATA **AUDIT** Tool connector.

7.2 Connecting the AIR **AUDIT** Tool to the local compressed air supply.

Connect a Quick Connect air coupler with the appropriate quick connect end to suit the local compressed air supply hose, and with a male ¼ inch NPT end, to the AIR IN port of the AIR **AUDIT** Tool using the appropriate sized wrench. Do not exceed 150 psi input. **To ensure that the AIR AUDIT Tool external and internal bulkhead nuts do not rotate while connecting the air supply hose; hold the external bulkhead nut still using a ¾ inch wrench.**

7.3 Connecting the output quick connect coupler on the AIR **AUDIT** Tool with the output air hose.

Connect the 10-foot air hose supplied as part of the **AUDIT** System to the AIR OUT port of the AIR **AUDIT** Tool. Use a 7/16 inch wrench if a yellow air hose has been supplied and use a 9/16 wrench if a red air hose has been supplied.

To ensure that the AIR AUDIT Tool external and internal bulkhead nuts do not rotate while connecting the air supply hose, hold the external bulkhead nut still using a ¾ inch wrench.

The **AUDIT** System is not supplied with connectors for connecting the air supply hose to the AIR **AUDIT**. **The user must provide the appropriate connector for connection of the air supply hose to the AIR AUDIT.**

If any tire or tires to be audited are to have their air pressure adjusted manually, a hand held or other type of manually operated tire gauge will be needed. If all tires are to have their air pressure adjusted manually, there will be no need for the AIR **AUDIT** Tool or the **AUDIT** AIR HOSE.

In either case, the user must provide the appropriate adapter(s) for connection between the user's compressed air supply hose and the valve stems of all the tires to be audited.

7.3.1 Verify that the line pressure from the compressed air supply is in the range of 130 psi to 150 psi.

7.3.2 Refer to Section 8.0 for a description of the Tire Auditing Procedure, which covers the use of the AIR **AUDIT** Tool and also the use of manual tire pressure measurements.

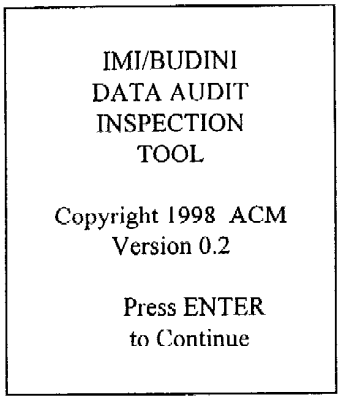
PERFORMING A TIRE AUDIT.

Prepare the AUDIT Tools as described in Section 7. Then continue with the instructions listed below.

8.1 Setting the Date and Time on the DATA **AUDIT** Tool Screen.

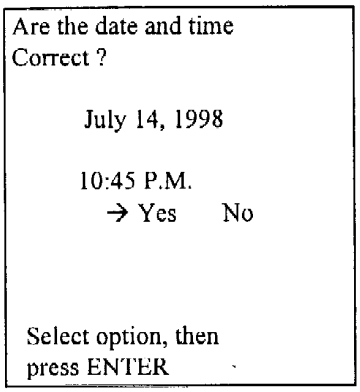
8.1.1 Press the ON/OFF button on the DATA **AUDIT** Tool until the following typical introductory screen appears. Press the + and - buttons to adjust the screen contrast to provide the best viewing contrast with the prevailing lighting conditions.

Introductory Screen (typical)

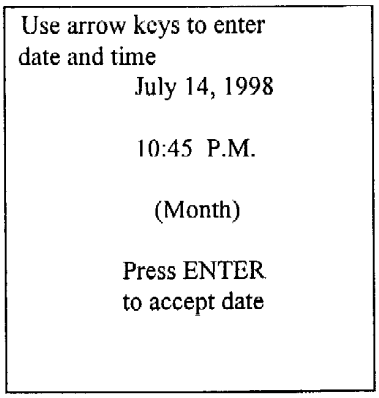


8.1.2 Press the ENTER button. The below-left typical Date and Time Screen will appear.

Date and Time Screen (typical)



Correct the Date and Time Screen (typical)

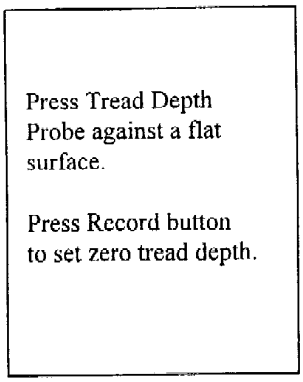


8.1.3 If the Date and Time are correct Press ENTER. The following Zero Tread Depth Probe Screen will appear.

8.1.4 If the Date and/or Time are incorrect select NO by pressing on the right-pointing arrow button and then pressing ENTER. The above-right Correct the Date and Time Screen will appear. Follow the prompts and use the right-pointing arrow button to correct the date and/or time as necessary.

8.1.5 Press ENTER when date and/or time have been corrected. (or if no correction is needed). The following Zero Tread Depth Probe Screen will appear.

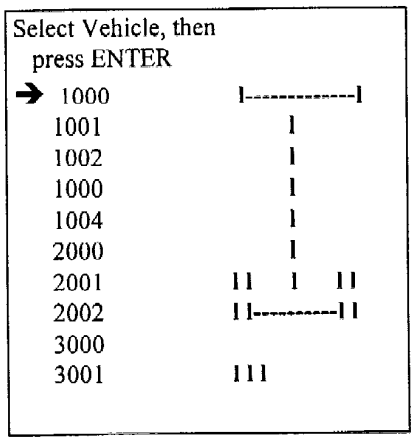
Zero Tread Depth Probe Screen



8.2 Conducting the **AUDIT** Database Audit Procedure

8.2.1 Press the TREAD **AUDIT** Tool probe against a flat surface until the probe tip is flush with the flat face of the TREAD **AUDIT** Tool. Hold the TREAD **AUDIT** Tool firmly in this position and press the Record button. The following typical Vehicle Menu screen will appear.

Vehicle Menu Screen (typical)



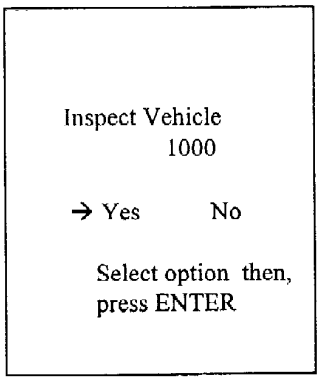
The initial Vehicle Menu screen has a listing of up to ten vehicle Identification Numbers (Ids). Each vehicle may be selected by using the up or down-pointing arrow buttons on the DATA **AUDIT** Tool to move the arrow at the left of the screen to point at the vehicle Id.

Additional screens, containing the remainder of the **AUDIT** database being audited, may be accessed by scrolling the down arrow off the bottom of each screen in turn.

Associated with each vehicle Id is a graphical representation of the corresponding vehicle showing all the wheel positions. Any spare tires associated with the selected vehicle are also graphically represented below the vehicle graphic.

8.2.2 Use the down-arrow button on the DATA **AUDIT** Tool to move the arrow on the screen to select the vehicle whose tires you wish to audit. Then press ENTER. The following typical Inspect Vehicle screen will appear.

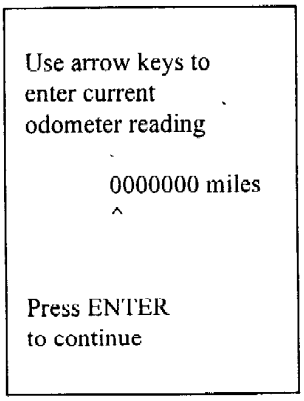
Inspect Vehicle Screen (typical)



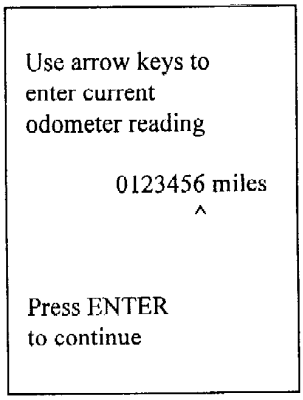
8.2.3 Confirm that the vehicle Id number shown on this screen corresponds to the vehicle that you intended to select. If it does press ENTER and the following Enter Odometer Reading screen will appear.

8.2.4 If the vehicle Id number does not correspond to the vehicle you intended to select, use the right-pointing arrow button on the DATA **AUDIT** Tool to select NO and press ENTER. You will be returned to the Vehicle Menu screen to allow you to re-select a vehicle. Do so and press ENTER The Inspect Vehicle screen will reappear, showing the reselected vehicle Id. Press ENTER. The following Enter Odometer Reading screen, on the left, will appear.

Enter Odometer Reading Screen



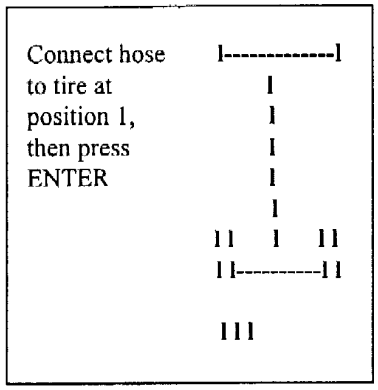
Enter Odometer Reading Screen (typical)



8.2.5 Note the selected vehicle odometer reading and enter it onto the screen, moving from left to right, by using the right pointing arrow button on the DATA **AUDIT** Tool to move to each odometer number position in turn. Use the up-pointing and down-pointing arrows to increase or decrease the number entered at each position. The left-pointing arrow may be used to backtrack for corrections or adjustments if necessary.

8.2.6 Upon completion of the odometer reading entry, as shown in the above-right screen, press ENTER. The following typical Connect Hose to Tire screen will appear.

Connect Hose to Tire Screen (typical)



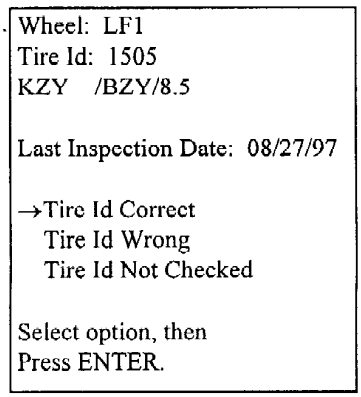
NOTE that the tire position 1 is blinking off and on.

The tire to be audited will be indicated by the blinking off and on of the graphic representing the wheel position.

8.2.7 Connect the hose assembly from the output port of the AIR **AUDIT** Tool to the tire at the wheel position that is blinking off and on. Make sure that the hose connection is secure and is not leaking air from the tire.

8.2.8 Switch the AIR **AUDIT** Tool ON by pushing the red button. This button will stay depressed and back-lit when the AIR **AUDIT** Tool is ON. Check the hose connections to ensure that there is no leaking air. Readjust the hose connections, if necessary, to stop any leaks. Then press ENTER. The following typical Wheel/Tire Id screen will appear.

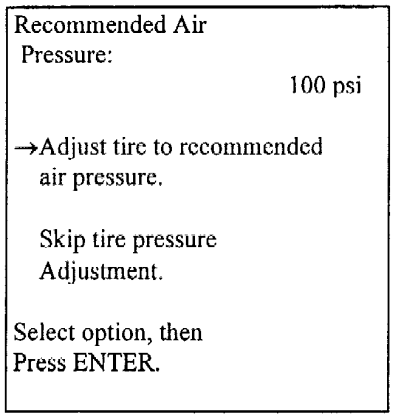
Tire Id Screen (typical)



8.2.9 Check the tire being audited to determine if the wheel position and the actual tire Id correspond to those shown on the screen.

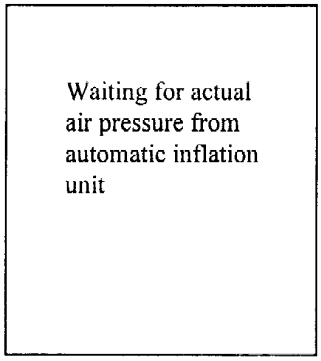
8.2.10 Select the appropriate option (Correct, Wrong or Not checked) by using the down-pointing arrow button and press ENTER. The following typical Air Pressure Adjustment screen will appear.

Air Pressure Adjustment Screen (typical)

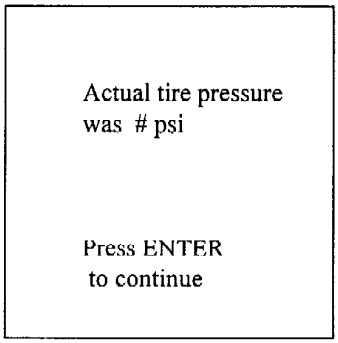


8.2.11 Press ENTER. The AIR **AUDIT** Tool will begin to measure the tire current air pressure and the following Waiting for Actual Air Pressure screen, on the bottom left, will appear.

Waiting for Actual Air Pressure Screen



Actual Tire Pressure Screen (typical)



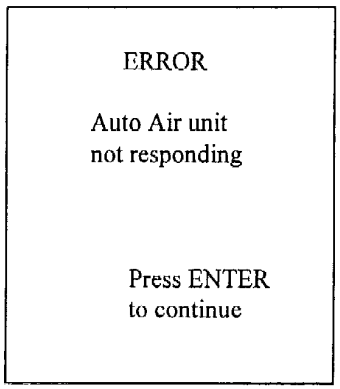
8.2.12 After a short time the above-right Actual Tire Pressure screen will appear automatically, with the tire pressure measured by the AIR **AUDIT** Tool in place of the " # " symbol. When this occurs, press ENTER and continue at Step 8.2.13.

NOTE 1: The AIR **AUDIT** Tool will not attempt to adjust the inflation of tires that are grossly over-inflated or under-inflated. See section 8.2.28.

NOTE 2: If, after about a minute, the following AIR **AUDIT** ERROR screen appears, it indicates that the radio connection between the DATA **AUDIT** and AIR **AUDIT** Tools is not operating correctly.

This may be due to the fact that the AIR **AUDIT** Tool is not switched ON, the reset button may have been depressed, or the distance between the DATA **AUDIT** and AIR **AUDIT** Tools may be too great, or it may be due to the use of DATA **AUDIT** and AIR **AUDIT** Tools with differently programmed identification codes.

AIR **AUDIT** ERROR screen



NOTE 3: If for any reason you need to halt a tire air pressure adjustment process, such as for example a bulge developing in the tire wall, press the RESET button. This will halt the tire air pressure adjustment immediately.

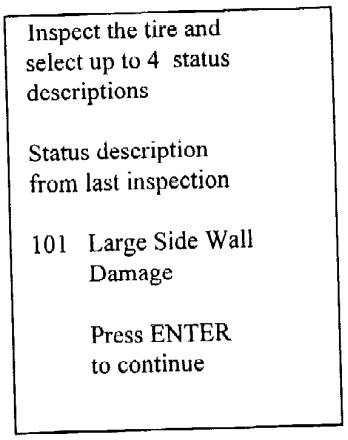
NOTE 4: Initial and final tire air pressure measurements, may be made with a hand held tire air pressure gauge or other type of manual air pressure gauge, instead of with an AIR **AUDIT** Tool, and the measurements made with the manual gauge may be recorded into the DATA **AUDIT** Tool database manually, as described in Step 8.3.

This manual operating procedure for adjusting the tire air pressure may be initiated by pressing ENTER when the above ERROR screen is displayed. It may also be initiated by selecting "Skip tire pressure adjustment" on the typical Air Pressure Adjustment Screen shown at Step 8.2.10.

8.2.13 After the Actual Tire Pressure screen appears with a valid tire air pressure measurement, and ENTER is pressed, the following Select Tire Status screen will appear. This screen, together with a following Add, Erase or Complete screen, will enable tire inspection status of tires being audited to be entered into **AUDIT** database.

NOTE: The AIR **AUDIT** Tool will continue to adjust the tire air pressure while the tire auditing inspections and entries are carried out. At the completion of the tire audit the typical Air Pressure Adjustment Completion screen shown at Step 8.2.28 will appear to confirm the completion of the tire pressure adjustment process.

Select Tire Status Screen

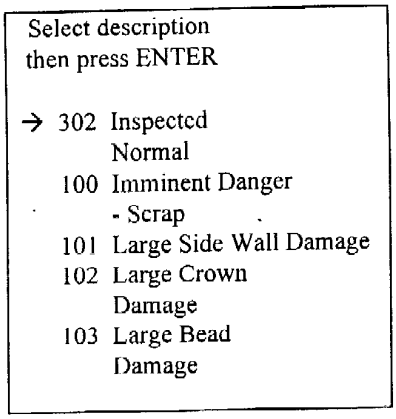


NOTE: The most serious of the status descriptions from the previous audit of the tire will appear as a "Status description from last inspection". In this typical example the status "101 Large Side Wall Damage" is shown as being previously selected.

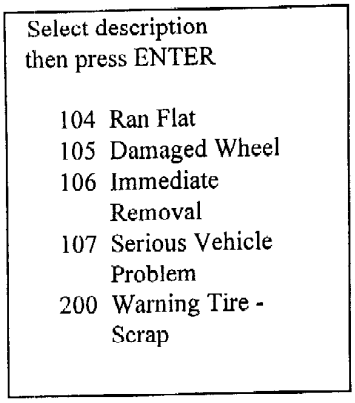
8.2.14 Press ENTER. The following typical Inspection Status Menu Screen will appear.

By scanning down through the options, using the down arrow button, a second typical Inspection Status Menu Screen 2, with additional typical damage descriptions, may be accessed.

Inspection Status Menu Screen 1(typical)



Inspection Status Menu Screen 2 (typical)



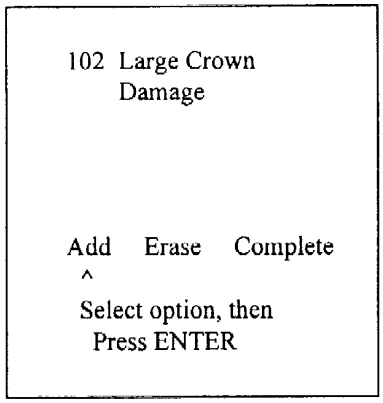
8.2.15 Thoroughly inspect the tire and note all conditions that correspond to a listed option on the above screens.

NOTE: A total of four tire conditions can be entered into the DATA **AUDIT** for each tire surveyed.

8.2.16 Use the Up and Down arrow buttons to select the first applicable condition you wish to report. As an example it will be assumed, that "102 Large Crown Damage" is selected as the first condition to be entered.

8.2.17 Press ENTER. The following Add, Erase or Complete screen will appear.

Add, Erase or Complete Screen



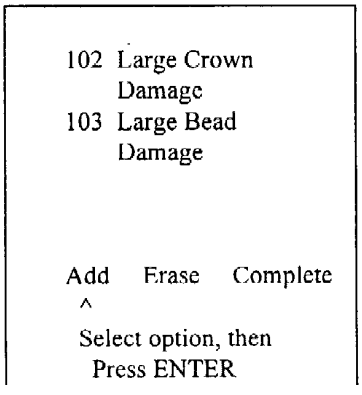
NOTE that "102 Large Crown Damage" is entered, and that the previous "101 Large Side Wall Damage" does not appear. This will have to be reentered if the tire has not been replaced and you agree with the damage description.

8.2.18 With the arrow pointing to "Add" press ENTER to return to the Select Description (of inspection status) Screen 1. This screen will reappear with the selection arrow pointing to the first choice (302 Inspected Normal).

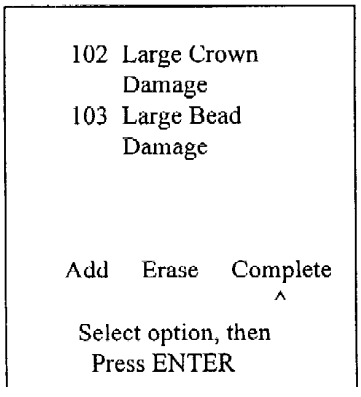
8.2.19 Move the arrow to your next condition description. (103 Large Bead Damage will be assumed to be your choice) and press ENTER.

The Add, Erase or Complete Screen will reappear with both of your selections listed, as shown in the following screen, to the left.

Add, Erase or Complete Screen



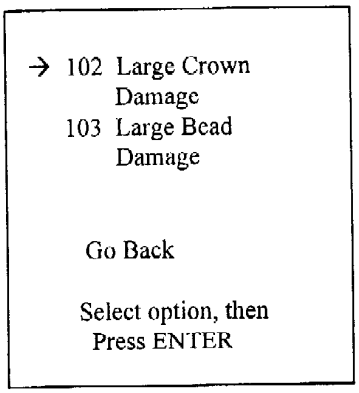
Add, Erase or Complete Screen



8.2.20 To enter these two choices into the **AUDIT** tire database, move the arrow on the screen so that it points to "Complete" as shown in the screen to the right above, and then press ENTER.

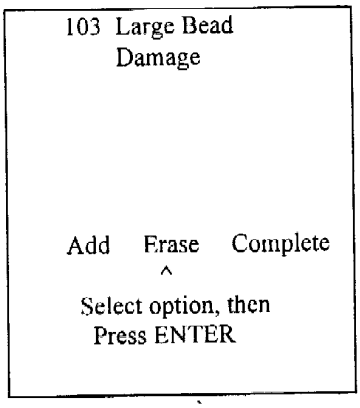
8.2.21 However if you decide to delete one of the description choices that you have made, move the arrow to "Erase" and press ENTER. The following Go Back screen will appear.

Go Back Screen

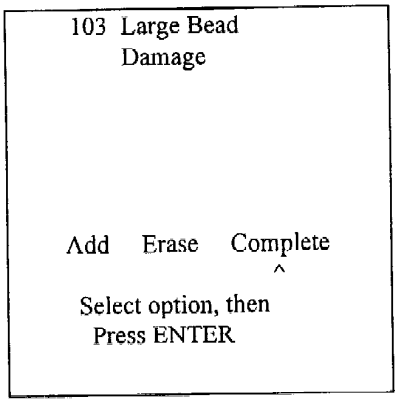


8.2.22 Move the horizontal arrow to point at the entry you wish to remove. It will be assumed, for this example, that you wish to remove "102 Large Crown Damage". Press ENTER. You will be returned to the Add, Erase or Complete Screen. The "102 Large Crown Damage" is deleted, while "103 Large Bead Damage" remains, as shown below.

Add, Erase or Complete Screen



Add, Erase or Complete Screen



8.2.23 If this is the only entry you wish to make, move the arrow to point at "Complete" as at right above, and press ENTER. The following Tread Depth screen will appear.

Tread Depth Groove Screen

```
Measure tread depth
At groove 1.

→Tread Groove 1
        ---- 1/32 inch
  Tread Groove 2
        ---- 1/32 inch
  Tread Groove 3
        ---- 1/32 inch
  Tread Groove 4
        ---- 1/32 inch

End
```

8.2.24 Press the TREAD **AUDIT** Tool against the tread of the tire under test, in four different tread grooves across the width of the tire, so that the probe is pressed into the body of the TREAD **AUDIT** Tool, as it contacts the bottom of each groove in turn.

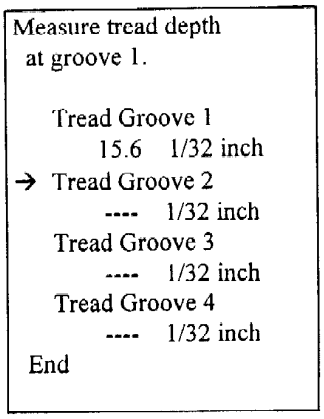
When the TREAD **AUDIT** Tool probe is bottomed in the first tire groove, press the RECORD button on the side of the TREAD **AUDIT** Tool.

This will cause the depth of the tire tread at that point to be entered onto the Tread Depth Groove Screen in the Tread Groove 1 position. The measured value will replace the dotted line, as shown in the following screen. The number entered is the number of thirty seconds of an inch of tread depth.

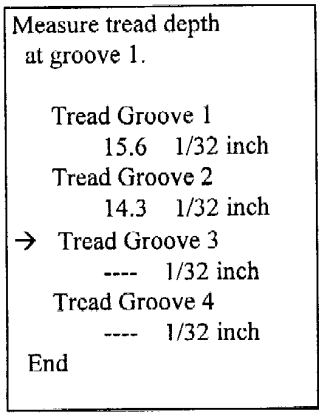
Repeat this measuring process for each of the four test positions in turn. The measured groove depths will be entered onto the screen sequentially as indicated in the following four typical screens.

NOTE: The ENTER button on the DATA **AUDIT** Tool may always be used in place of the RECORD button on the TREAD **AUDIT** Tool if the operator finds it more convenient.

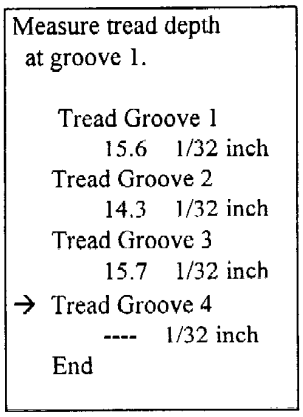
Tread Depth Groove Screen 1 (typical)



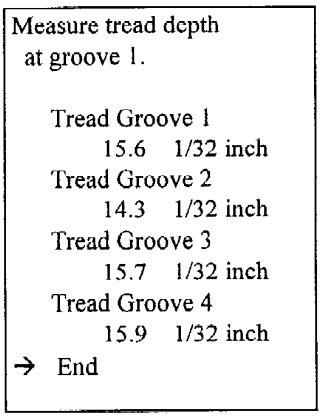
Tread Depth Groove Screen 2 (typical)



Tread Depth Groove Screen 3 (typical)

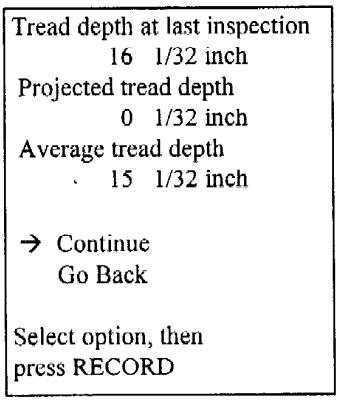


Tread Depth Groove Screen 4 (typical)



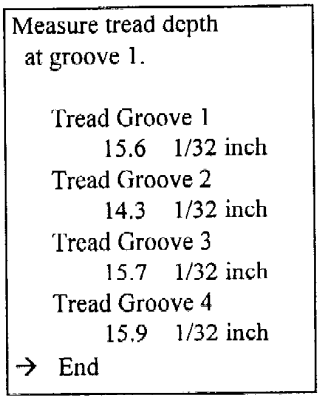
8.2.25 Press ENTER. The following typical Tread Depth Measurements Summary screen will appear.

Tread Depth Measurements Summary Screen (typical)



8.2.26 If you wish to redo the tread depth measurements move the arrow to select "Go Back" and press the RECORD button on the TREAD **AUDIT** Tool. The Tread Depth Groove Screen 4 will reappear so that new measurements may be made. To re-measure any tread groove, use the arrow keys to select that groove and use the TREAD **AUDIT** Tool to measure the tread depth as in section 8.2.24. This may be repeated until you are satisfied that all measurements are correct. To accept the displayed tread measurements, select END and press the RECORD button on the TREAD **AUDIT** Tool.

Tread Depth Groove Screen 4 (typical)

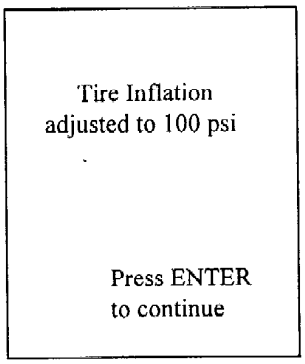


8.2.27 Press ENTER. The Tread Depth Measurements Summary screen will reappear, but with different calculated values.

8.2.28 If no changes are to be made press the RECORD button while "Continue" is selected on The Tread Depth Measurements Summary screen.

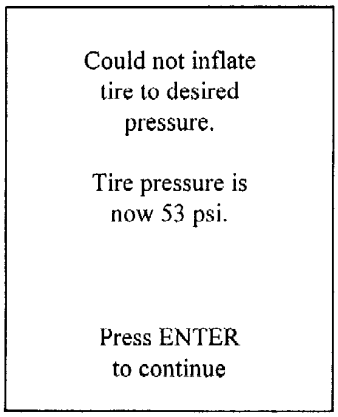
The following typical Air Pressure Adjustment Completion screen, confirming completion of the tire air pressure adjustment by the AIR **AUDIT** unit will appear.

Air Pressure Adjustment Completion Screen (typical)



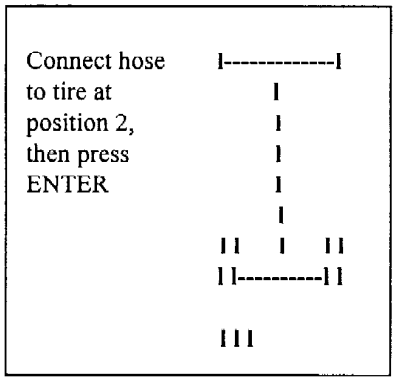
If the AIR **AUDIT** Tool could not adjust the inflation, a screen like the following will be displayed. Problems that could prevent an inflation adjustment include compressor pressure that is too high or too low, initial tire pressure that is too high or too low, or a leak or blockage in the air connections.

Could Not Inflate Screen



8.2.29 Press ENTER. The following typical Connect Hose to Tire Screen will appear. The next tire to be audited will be indicated by its wheel graphic flashing off and on.

Connect Hose to Tire Screen (typical)



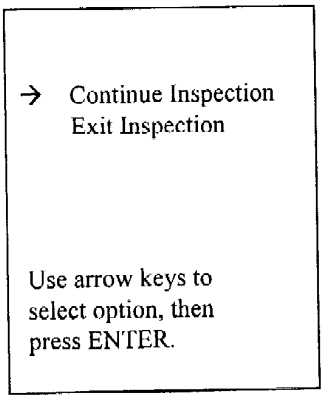
NOTE that the tire position 2 is now blinking off and on.

8.2.30 Repeat the tire auditing process for each tire in turn by repeating the procedure from Step 8.2.7 through Step 8.2.31 for each tire of the vehicle being audited.

NOTE: To end a vehicle audit before all tires have been audited, simply use the arrow keys to scroll off the vehicle. For example, if tire 2 is selected, pressing the left arrow key will skip to step 8.2.31.

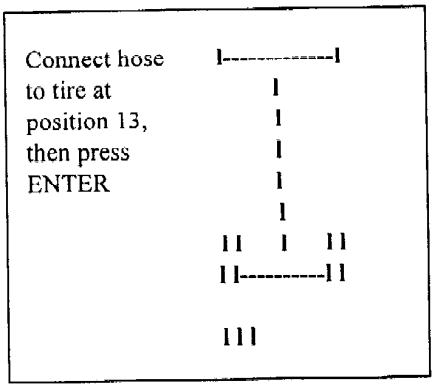
8.2.31 When the last tire of a vehicle has been audited, pressing ENTER will cause the following Continue/Exit Inspection screen to appear.

Continue/Exit Inspection Screen (typical)

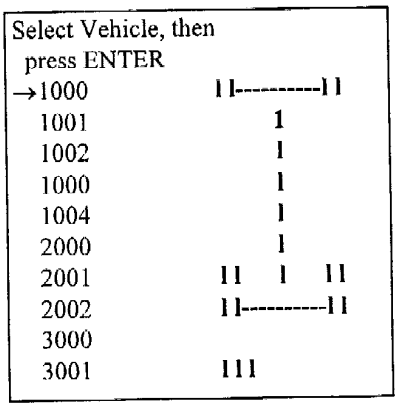


8.2.32 Selecting "Continue Inspection" will return you to the typical "Connect Hose" screen of the last tire that you audited, as at left below. This will allow you to completely re-audit this tire. Selecting "Exit Inspection" will cause the typical Vehicle Menu screen, as at right below, to appear.

Connect Hose to Tire Screen (typical)



Vehicle Menu Screen (typical)

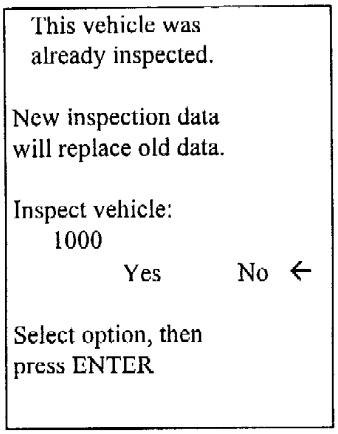


You will then be in a position to select the next vehicle to be audited.

8.2.33 However if this vehicle is some considerable distance from the vehicle you have just audited, you should exit from the audit process by pressing the ON/OFF button on the DATA **AUDIT** Tool, switching OFF the AIR **AUDIT** Tool and disconnecting all the auditing setup air hose connections. You should then take all the **AUDIT** Tools and accessories to the next vehicle to be audited and set up the auditing arrangement as described in Section 7.0.

NOTE: If you re-select a vehicle that you have already audited completely, and then press ENTER, the following typical Vehicle Was Already Inspected screen will appear.

Vehicle Was Already Inspected Screen

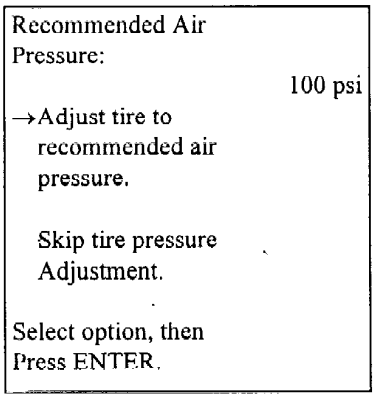


8.2.34 If you do not wish to **AUDIT** this vehicle again select "NO". You will be returned to the Vehicle Menu screen, from which you can select the next vehicle you wish to audit. (See Step 8.2.1)

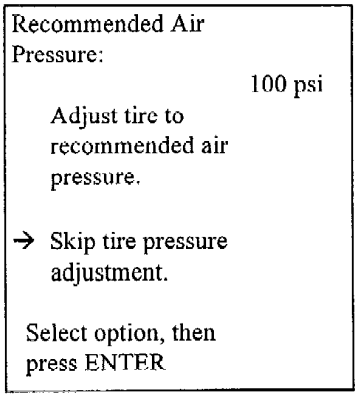
8.3 Adjusting a Tire Air Pressure Without Using the AIR **AUDIT** Tool.

When the following typical Air Pressure Adjustment screen at left is displayed at Step 8.2.10, the decision can be made to use the AIR **AUDIT** Tool to perform the operation automatically, by selecting "Adjust tire to recommended air pressure", or to perform the operation manually by selecting "Skip tire pressure adjustment", as shown at right below.

Air Pressure Adjustment Screen (typical)



Air Pressure Adjustment Screen (typical)

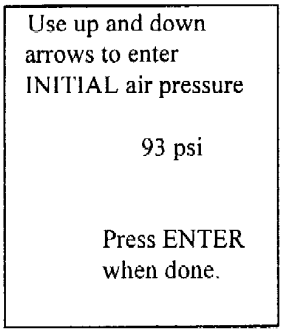


8.3.1 If the tire air pressure adjustment is to be conducted manually, move the arrow to "Skip tire pressure adjustment", as shown at right above, and press ENTER.

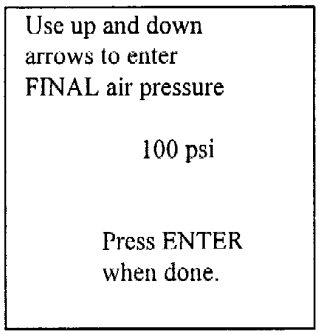
8.3.2 The following Initial Tire Air Pressure screen, at bottom left, will appear. Enter the manually measured initial tire air pressure by using the horizontal and vertical arrow buttons, then press ENTER.

8.3.3 The following Final Tire Air Pressure Screen will appear. Enter the manually measured adjusted final tire air pressure, then press ENTER.

Initial Tire Air Pressure Screen (typical)



Final Tire Air Pressure Screen (typical)



8.3.4 The Tire Status Screen at Step 8.2.14 will appear. Continue from Step 8.2.14.

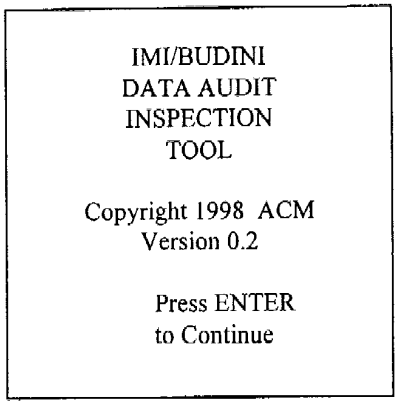
CONDUCTING AN AUDIT DATABASE UPLOAD FROM THE DATA AUDIT TOOL

Take the DATA **AUDIT** Tool to the **AUDIT** Battery Charger/Docking Tool and proceed as follows:

9.1 Setting Date and Time on the DATA **AUDIT** Tool Screen

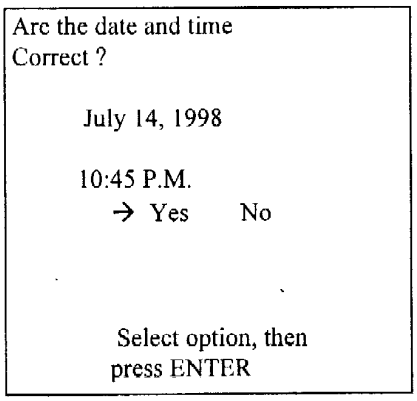
9.1.1 Press the ON/OFF button on the DATA **AUDIT** Tool until the following typical Introductory screen display appears. Press the + and - buttons to adjust the screen contrast lighting to provide the best viewing contrast with the prevailing lighting conditions.

Introductory Screen (typical)

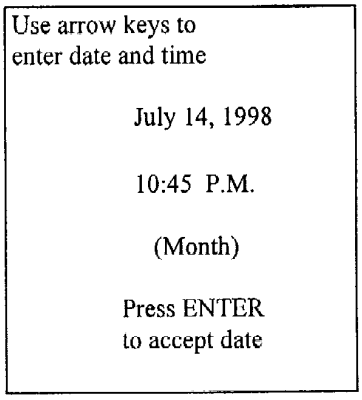


9.1.2 Press the ENTER button. The below-left typical Date and Time Screen will appear.

Date and Time Screen (typical)



Correct the Date and Time Screen (typical)



9.1.3 If the Date and Time are correct Press ENTER and go to paragraph 9.2.

9.1.4 If the Date and/or Time are incorrect then proceed as follows:-

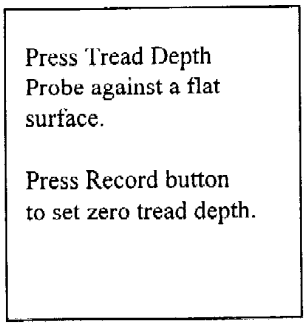
Select NO by pressing on the right-pointing arrow button and then pressing ENTER. The above-right Correct the Date and Time Screen will appear.

Follow the prompts and use the right-pointing arrow button to correct the date and/or time as necessary.

Press ENTER when date and/or time have been corrected.

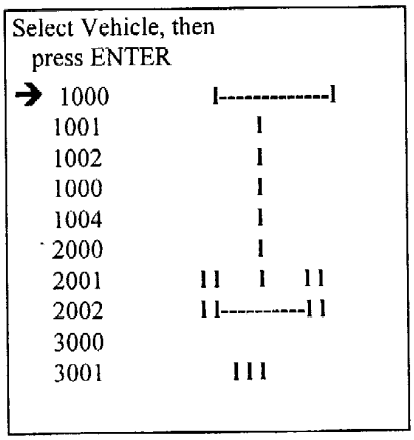
The Zero Tread Depth Probe Screen will appear following either of the above two screens.

Zero Tread Depth Probe Screen



9.1.5 Press the ENTER button. The DATA **AUDIT** Tool will display the vehicle selection menu.

Vehicle Menu Screen (typical)



9.2 Installing the DATA **AUDIT** Tool into the **AUDIT** Battery Charger/Docking Tool Docking Section

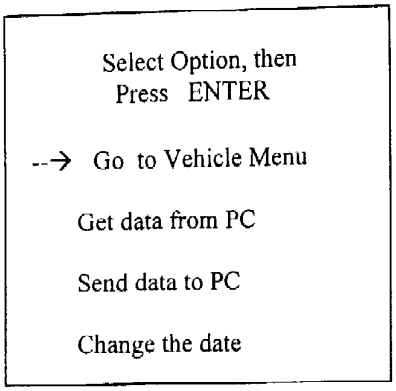
NOTE: Before installing the DATA **AUDIT** Tool into the **AUDIT** Battery Charger/Docking Tool, ensure that the **AUDIT** Battery Charger/Docking Tool is connected to a live standard 110 - 125 volt 60Hz outlet. Also ensure that the RS 232 cable is connected between the **AUDIT** Battery Charger/Docking Tool and the computer Com Port. Also ensure that the required **AUDIT** database is in the DATA **AUDIT** Tool and that the computer is ready to receive the uploaded tire audit database from the DATA **AUDIT** Tool.

9.2.1 Place the DATA **AUDIT** Tool, with the screen side uppermost, into the docking channel in the **AUDIT** Battery Charger/Docking Tool.

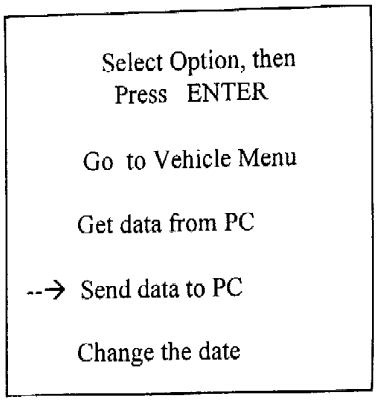
9.3 Conducting the **AUDIT** Database Upload Procedure

9.3.1 Press the MENU button. The following MENU screen at left will appear.

MENU Screen

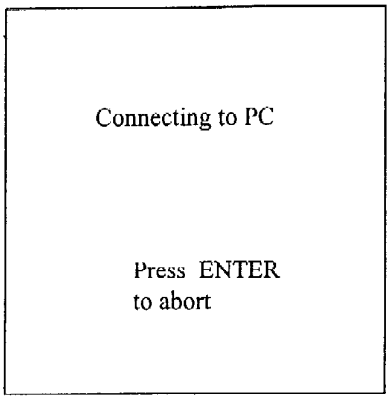


MENU Screen



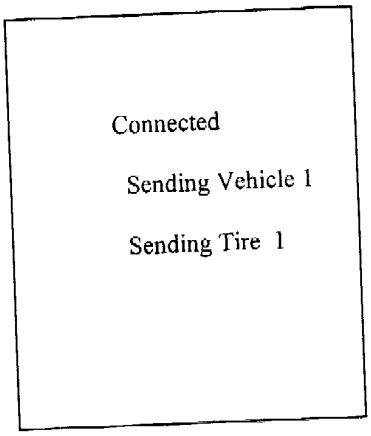
9.3.2 Select "Send data to PC", using the down arrow button, as shown at right above, and then press the ENTER button. The following typical Connecting to PC screen will appear.

Connecting to PC Screen



9.3.3 When the connection between the computer and the DATA **AUDIT** Tool is established the following Connected screen will appear.

Connected Screen

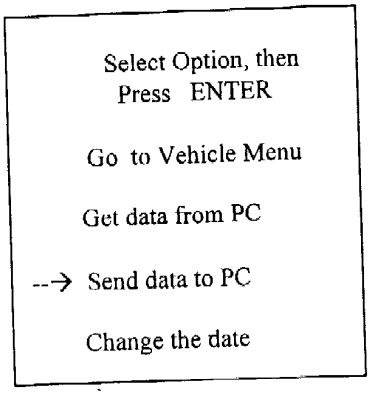


9.3.4 The screen will show the progression through all tires on Vehicle 1, then the vehicle number will change to 2, and the progression through all tires on Vehicle 2 will be seen.

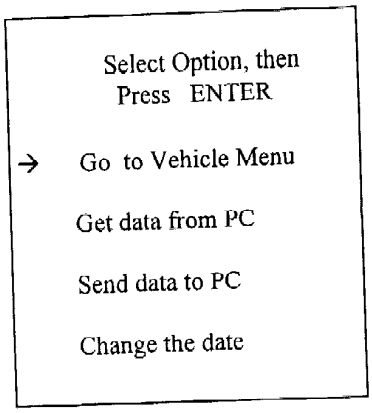
9.3.5 This uploading of the vehicle and tire data will continue until the last tire on the last vehicle has been uploaded.

9.3.6 Upon completion of the upload, the MENU screen will appear again, with the arrow still pointing to "Send Data to PC", as shown at left below.

MENU Screen



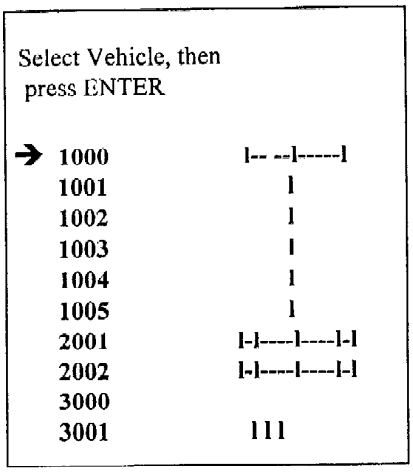
MENU Screen



9.3.7 Move the arrow to point at "Go to Vehicle Menu", and then press ENTER.

The typical Vehicle Menu screen will reappear, as shown below, with the vehicles and tires database data that was just uploaded still present. This database will only be replaced when a new database is downloaded into the DATA **AUDIT** Tool, as described in Section 6.0.

Vehicle Menu Screen



9.3.8 Press the ON/OFF button to switch the DATA **AUDIT** Tool OFF and end the upload operation.

9.4.1 Remove the DATA **AUDIT** Tool from the docking channel

9.4 Verifying the Uploading of the **AUDIT** Database into the Computer

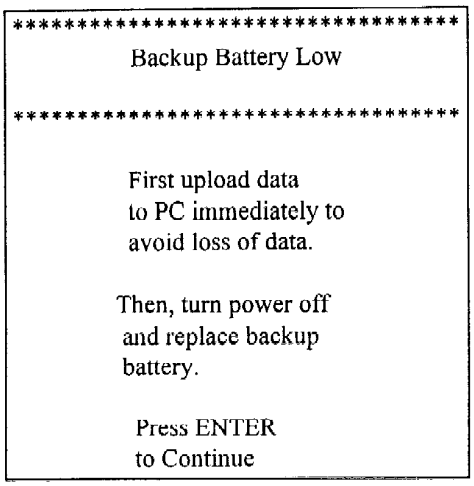
9.4.1 Check with the operator of the computer to which the database was uploaded, to determine if the upload was completed successfully, with all the database vehicles and their respective tires and audit changes being uploaded correctly.

LOW INTERNAL BACKUP BATTERY WARNINGS

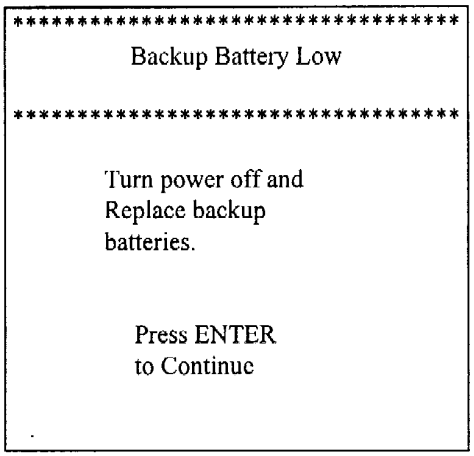
The following Low Backup Battery Screens will follow the Introductory Screen if the internal battery is dangerously low and needs replacing.

10.1 If the internal backup battery is low and needs replacing and audited data is stored in the DATA AUDIT Tool and has not been Uploaded into the AUDIT Tire Database computer; the following screen will appear.

DATA Stored in DATA AUDIT Tool But Not Yet Uploaded Screen

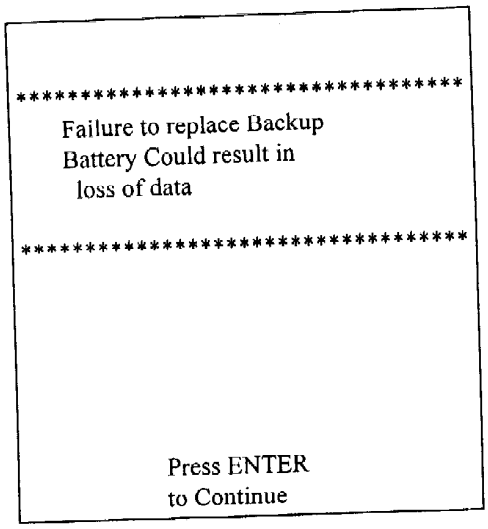


If the internal backup battery needs replacing and there is no audit data in the DATA **AUDIT** Tool that has not been uploaded, the following screen will appear.



10.2 Pressing ENTER will cause the following Failure to Replace Backup Battery screen to appear.

Failure to Replace Backup Battery Screen



10.3 Action to be Taken

Take the appropriate action to avoid loss of valuable data. Make immediate arrangements for, and conduct a database upload into the **AUDIT** Tire Management Database Computer.

Consult International Marketing, Inc. to arrange for a replacement DATA **AUDIT** Tool or the replacement of the internal backup battery.